

01/30/14 Agenda

- Warm up exercise
- I'll accept any late homework on Sections 5.3-5.5 until this Friday 1/31
- Quiz Corrections:
 - Quiz 5.3 corrections must be done by Friday 1/31 (tomorrow)
 - Quiz 5.4-5.5 corrections must be done by next Thursday (2/6)
- Review Homework - Worksheet 2 - Solve Systems by Graphing
- Section 6.2 - Solve by Substitution

Homework - Worksheet 4 - Solve by Substitution

Warm Up - Homework out!

Identify m and b , then determine the number of solutions:

1. $y = 4x - 3$

$m =$

$4/1$

$b = -3$

$y = 4x + 7$

$m =$

$4/1$

$b = 7$



SAME SLOPE

DIFFERENT INTERCEPT

PARALLEL LINES, NO SOLUTION

2. $y = -\frac{1}{2}x + 3$

$m =$

$-1/2$

$b =$

3

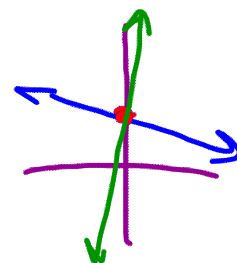
$y = 4x + 3$

$m =$

$4/1$

$b =$

3



DIFFERENT SLOPES

MEANS 1 SOLUTION

$(0, 3)$

6.2 - Solve SoE by Substitution

Target 6B

	<p>There are multiply methods (ways) to solve systems of equations. You could always graph to find a solution, but there are times that graphing is impractical or inaccurate. Today we will learn another strategy for solving systems.</p>
What does "substitution" mean?	<p>To take out and replace with something else. OF EQUAL VALUE</p>
Substitution Method	<p>Is best with systems with ONE solution.</p> <p>Our goal is to only have 1 variable.</p>
How do we do it?	<ol style="list-style-type: none">1. Isolate (get alone) one of the variables in one equation.2. Replace (substitute) the equation in step 1 into the other equation replacing the variable.3. Solve for the variable.4. Plug the value back into one of the original equations and solve for the missing value.5. Write the answer as an ordered pair.

6.2 - Solve SoE by Substitution

Target 6B

Examples: Solve the following systems by substitution:

1. Isolate (get alone) one of the variables in one equation.
2. Replace (substitute) the equation in step 1 into the other equation replacing the variable.
3. Solve for the variable.
4. Plug the value back into one of the original equations and solve for the missing value.
5. Write the answer as an ordered pair.

$$x = 4y$$

$$4x - y = 75$$

$$(20, 5)$$

$x \quad y$

$$x = 4y$$

$$x = 4(5)$$

$$x = 20$$

$$4x - y = 75$$

$$4(4y) - y = 75$$

$$16y - y = 75$$

$$15y = 75$$

$$\frac{15y}{15} = \frac{75}{15}$$

$$y = 5$$

$$x = 4y$$

$$(20, 5)$$

CHECK
ANSWER

$$x = 4y$$

$$20 \stackrel{?}{=} 4(5)$$

$$20 = 20$$

$$4x - y = 75$$

$$4(20) - 5 \stackrel{?}{=} 75$$

$$80 - 5 \stackrel{?}{=} 75$$

$$75 = 75$$

6.2 - Solve SoE by Substitution

Target 6B

Examples: Solve the following systems by substitution:

1. Isolate (get alone) one of the variables in one equation.
2. Replace (substitute) the equation in step 1 into the other equation replacing the variable.
3. Solve for the variable.
4. Plug the value back into one of the original equations and solve for the missing value.
5. Write the answer as an ordered pair.

Handwritten solution for the system of equations:

$$\begin{aligned} 4x + y &= 12 \\ -2x - 3y &= 14 \end{aligned}$$

Step 1: Isolate y in the first equation.

$$\begin{array}{r} 4x + y = 12 \\ -4x \quad -4x \\ \hline y = -4x + 12 \end{array}$$

Step 2: Substitute $y = -4x + 12$ into the second equation.

$$\begin{aligned} -2x - 3(-4x + 12) &= 14 \\ -2x + 12x - 36 &= 14 \\ 10x - 36 &= 14 \\ +36 \quad +36 \\ \hline 10x &= 50 \\ \frac{10x}{10} &= \frac{50}{10} \\ x &= 5 \end{aligned}$$

Step 3: Solve for x .

Step 4: Plug $x = 5$ back into the first equation to solve for y .

$$\begin{aligned} 4x + y &= 12 \\ 4(5) + y &= 12 \\ 20 + y &= 12 \\ -20 \quad -20 \\ \hline y &= -8 \end{aligned}$$

Step 5: Write the answer as an ordered pair.

SOLUTION $(5, -8)$

6.2 - Solve SoE by Substitution

Target 6B

Example:

There are 2 numbers that have been chosen. The sum of these numbers is 120. The larger number is 3 times the smaller number. Let x be the smaller number and let y be the bigger number. Write a system of equations to model this scenario. Find the values of the 2 numbers.

$x = \text{SMALLER}$

$$x + y = 120$$

$y = \text{LARGER}$

$$y = 3x$$

$$x + (3x) = 120$$

$$4x = 120$$

$$x = 30$$

$$y = 90$$

$X = \text{SMALLER}$

$Y = \text{LARGER}$

$$X + Y = 50$$

$$Y = 3X + 10$$

$$X + (3X + 10) = 50$$

$$4X + 10 = 50$$

$$4X = 40$$

$$X = 10$$

$$X = 10$$

$$Y = 40$$